UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P O Box 1450
Alexandria, Virginia 22313-1450
www uspto gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/570,597	02/05/2007	Janne Peisa	JRL-2380-1350	2970

23117 7590 07/17/2009
NIXON & VANDERHYE, PC
901 NORTH GLEBE ROAD, 11TH FLOOR
ARLINGTON, VA 22203

EXAMINER	
PATEL, MAHENDRA R	

ART UNIT	PAPER NUMBER
2617	

MAIL DATE	DELIVERY MODE
07/17/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/570,597	PEISA ET AL.	
	Examiner	Art Unit	
	MAHENDRA PATEL	2617	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _04/15/2009._.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-18_ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-18_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _06 March 2006_ is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _03/06/2006, 04/15/2009_.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Status of the Claims

This communication is in response to amendment filed on 04/14/2009.
Application No: 10/570,597.

Claims 1-18 are pending.
Claims 15-18 are newly added with amendments.

Response to Amendment

1. An examiner's Response to the record appears below.

2. Applicant's arguments with respect to claims 1-18 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. **Claims 1-18** are rejected under 35 U.S.C. 103(a) as being unpatentable over Grilli et al. (US 20040032836 A1) in view of Suzuki et al. (US 20040042492 A1).

Regarding claim 1, Grilli teaches a method of aligning Transmission Time Intervals of physical channels in the uplink and downlink directions of a bidirectional radio communication system, the method comprising: measuring or estimating the response processing delay at a user terminal ([0009] (e.g. For the W-CDMA standard, the time difference between a new candidate base station and a reference base station can be reported via an "SFN-SFN observed time difference **type 1 measurement**" (where SFN denotes system frame number). This **measurement includes two parts**. The first part provides the chip-level timing between the two base stations, which can be derived by detecting the timing of the pseudo-noise (PN) sequences used to descramble the downlink signals from these base stations. The second part provides the frame-level timing between the two base stations, which can be derived by processing (i.e., demodulating and decoding) a broadcast channel transmitted by the base stations. These two parts are encapsulated into a **report message that is transmitted from the terminal to the system (i.e.** measurement or estimate the response processing delay at a user terminal). [0074] in **response to the request**, the terminal estimates the chip-level time difference for each base station in the list. The chip-level time difference may be determined for each base station relative to the timing of the reference base station, which is a specific base station in the terminal's active set and is known to both the system and the terminal));

Grilli does not expressly teach delaying TTI of the uplink and downlink for alignment in a communication system.

However, the preceding limitation is known in the art of communications. In the same field of endeavor, Suzuki teaches aligning TTI of instance radio channels in the uplink and downlink directions ([0066] (e.g. A preferred embodiment of the invention is therefore to have a **variable size TTI** for uplink and downlink directions, and a different number of ACK/NAK sub -TTI's are defined depending on the respective TTI sizes. The **TTI size** t.sub.TTI could be **configurable parameter** of the transmitter that needs to be signaled to the receiver. It would for be possible to **vary the TTI length** (I.e. Delaying by variable size TTI) for downlink transmission between three slots as described previously and one slot. If in downlink direction one slot is used, for each TTI in downlink direction (i.e. for each time slot) an ACK/NAK sub -TTI of one time slot would be used in uplink direction, similar to the scheme depicted in FIG. 3. To obtain a flexible timing in such a case where the uplink sub -TTI is the same as the downlink TTI, different ACK/NAK signals need to be defined. It can happen that multiple ACK/NAK messages are received at the same time that needs to be distinguished. **There is the possibility that the downlink transmission is reconfigured from a TTI of one time slot to a TTI of three time slots while keeping the uplink sub -TTI of the ACK/NAK signal at one time slot** (i.e. delaying the TTI of an uplink channel with respect to a corresponding downlink channel by an amount dependent upon the measurement or estimate). In doing so, the possibility of a **flexible timing** (three time instances) of the feedback channel is obtained such as depicted in FIG. 6, while keeping exactly the same uplink slot structure. Such uniform uplink slot structure will reduce the implementation complexity));

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invitation to implement the methods of Suzuki within the method of Grilli in a wireless

communication system. The new method improves wireless device interfacing and power scheme in addition to making it easier to manage in a low cost environment.

Regarding claim 2, Grilli in view of Suzuki teaches all the limitations of clam 1. Grilli further teaches a method wherein said bidirectional radio communication system is a WCDMA system ([0007] (e.g. in accordance with the **W-CDMA standard**, the base stations are not required to be operated synchronously. When operated asynchronously, from a terminal's perspective, the timing (and thus, the radio frames) of the base stations may not be aligned and the reference time of each base station may be different from that of the other base stations)).

Regarding claim 3, Grilli in view of Suzuki teaches all the limitations of clam 1. Suzuki further teaches a method wherein the amount by which the Transmission Time Intervals (TTIs) of the uplink physical channel are delayed is the minimum number of radio frame time intervals required to exceed the response processing delay ([0062] (e.g. While in the embodiment of FIG. 7, the difference of the **minimum and maximum processing times** t.sub.RXproc has been increased so that the first and the last possible sub -TTI for each packet are positioned in **neighboring** TTI's, this difference can still be increased (i.e. delayed is the minimum number of radio frame time intervals required to exceed the response processing delay). This is depicted in FIG. 8 where the sub -TTI's that relate to one packet are still more separated. This, once again, increases the flexibility without affecting the unambiguity of the packet correlation)).

Regarding claim 4, Grilli in view of Suzuki teaches all the limitations of clam 1. Suzuki further teaches a method wherein said data is data which generates an automatic response on the part of the user terminal ([0002] (e.g. In common data communications systems, error detection

of non-real time services is usually based on **Automatic Repeat reQuest** (ARQ) **schemes** (i.e. data is data which generates an automatic response on the part of the user terminal) which are combined with Forward Error Correction (FEC). The combination of ARQ and FEC techniques is often called hybrid ARQ (HARQ))).

Regarding claim 5, Grilli in view of Suzuki teaches all the limitations of clam 1. Suzuki further teaches a method wherein said response contains an acknowledgement to the sender of the data ([0006] (e.g. Since the transmitter has to be able to receive **requests from the receiver**, the transmitter further comprises a duplexer which allows for using one antenna for transmission and reception purposes. When the transmitter receives a signal, it shifts the signal with the RF circuit into the base band, despreads the signal in the despreader, forwards the despread signal to the demodulator, and extracts an ACK/NAK signal from the **demodulated data**. An **ACK message** informs the transmitter that the receiver was able to successfully decode the transmitted PDU. A NAK message informs the transmitter of a decoding error (i.e. response contains an acknowledgement))).

Regarding claim 6, Grilli in view of Suzuki teaches all the limitations of clam 1. Grilli further teaches a method wherein the user terminal measures its response processing delay and computes the amount of delay to be applied to uplink Transmission Time Intervals based upon that measurement, and signals that delay amount to the Radio Access Network of the WCDMA system ([0063] (e.g. For the W-CDMA system, the SFN-SFN type 1 **measurement** can be partitioned into the frame-level timing and the chip-level timing, as described above. Whenever requested to perform and report **time difference measurements** for a list of one or more base stations, the terminal measures and reports the chip-level timing for each base station in the list.

Additionally, the **terminal also measures and reports the frame-level timing** and includes this information in the SFN-SFN type 1 measurement only if required (e.g., as directed by the system) (i.e. user terminal measures its response processing delay))). [0087] In an embodiment, the base stations that are not in the terminal's active set but are in the **neighborhood of the terminal** (i.e., neighbor base stations) may be instructed by the system to **measure the uplink transmission from the terminal** (e.g., a transmission on the uplink dedicated physical channel (DPCH)). If the neighbor base stations are able to receive the **uplink transmission with sufficient strength**, then they can accurately **estimate the arrival time of the uplink transmission (I.e.** computes the amount of delay to be applied to uplink Transmission Time Intervals based upon that measurement, and signals that delay amount to the Radio Access Network). Based on the estimated signal arrival times from the neighbor base stations and a priori knowledge of the time relation between common channel frames among the various active and neighbor base stations, the **system can determine the proper timing for each neighbor base station that may be added to the terminal's active set such that the downlink transmission** from the added base station is properly **time-aligned at the terminal**)).

Regarding claim 7, Grilli in view of Suzuki teaches all the limitations of clam 1. Grilli further teaches a method wherein the response processing delay is measured by the user terminal and is transmitted to the Radio Access Network, and the Radio Access Network determines an appropriate delay amount based upon the received measurement, and sends the delay amount to the user terminal ([0087] (e.g. In an embodiment, the base stations that are not in the terminal's active set but are in the **neighborhood of the terminal** (i.e., neighbor base stations) may be instructed by the system to **measure the uplink transmission from the terminal** (e.g., a

transmission on the uplink dedicated physical channel (DPCH)). If the neighbor base stations are able to receive the **uplink transmission with sufficient strength**, then they can accurately **estimate the arrival time of the uplink transmission (I.e.** computes the amount of delay to be applied to uplink Transmission Time Intervals based upon that measurement, and signals that delay amount to the Radio Access Network). Based on the estimated signal arrival times from the neighbor base stations and a priori knowledge of the time relation between common channel frames among the various active and neighbor base stations, the **system can determine the proper timing for each neighbor base station that may be added to the terminal's active set such that the downlink transmission** from the added base station is properly **time-aligned at the terminal (i.e.** and the Radio Access Network determines an appropriate delay amount based upon the received measurement, and sends the delay amount to the user terminal))).

Regarding claim 8, Grilli in view of Suzuki teaches all the limitations of clam 1. Grilli further teaches a method wherein the response processing delay or an uplink Transmission Time Interval delay amount is pre-programmed into a memory of the user terminal ([0048] (e.g. In W-CDMA, **20 ms is the interleaver size**, which is also referred to as the **Transmission Time Interval (i.e.** Transmission Time Interval delay amount is pre-programmed into a memory of the user terminal). Since a transport block is 20 ms long, the number included in each radio frame is not the real SFN value, but derived from an SFNPrime, i.e., SFN=SFNprime for the first 10 ms frame of the **20 ms TTI** and SFN=SFNprime+1 for the last 10 ms frame of the 20 ms TTI. **The start of the transmitted radio frames** may be determined by processing the SCH and/or CPICH and these frame start times may then be used as the signal arrival times for the base stations)).

Regarding claim 9, Grilli in view of Suzuki teaches all the limitations of clam 1. Grilli further teaches a method wherein the response processing delay or an uplink Transmission Time Interval delay amount is sent from the user terminal to the Radio Access Network ([0048] (e.g. ([0048] (e.g. In W-CDMA, **20 ms is the interleaver size**, which is also referred to as the **Transmission Time Interval (i.e.** Transmission Time Interval delay amount is pre-programmed into a memory of the user terminal). Since a transport block is 20 ms long, the number included in each radio frame is not the real SFN value, but derived from an SFNPrime, i.e., SFN=SFNprime for the first 10 ms frame of the **20 ms TTI** and SFN=SFNprime+1 for the last 10 ms frame of the 20 ms TTI. **The start of the transmitted radio frames** may be determined by processing the SCH and/or CPICH and these **frame start times** may then be used as the signal arrival times for the **base stations** (I.e. Transmission Time Interval delay amount is sent from the user terminal to the Radio Access Network))).

Regarding claim 10, Grilli in view of Suzuki teaches all the limitations of clam 7. Grilli further teaches a method wherein the Radio Access Network uses the received response processing delay or an uplink Transmission Time Interval delay amount to determine the delay amount for the said user terminal and, optionally, for other user terminals communicating with the Radio Access Network ([0049] (e.g. The W-CDMA standard defines an SFN-SFN measurement, which is **indicative of the time offset** .DELTA.T.sub.X, Y in FIG. 2D. This **measurement** can be made by the terminal and **sent to the system** so that the transmission from a new **base station** may be compensated as part of the handover process (i.e. RAN uses TTI delay amount to determine the delay amount for the said user terminal)).

Regarding claim 11, Grilli teaches a user terminal for use with a bidirectional radio communication system ([0008] (e.g. While in **soft handover** (I.e. bidirectional radio communication system), a terminal concurrently receives data transmissions (i.e., radio frames) from multiple base stations. To ensure that the radio frames arrive at the terminal within a particular time window so that they can be properly processed and recovered, the W-CDMA standard provides a mechanism whereby the starting time of the terminal-specific radio frames from each base station to the terminal can be adjusted. Typically, before a new base station is added to the terminal's active set, this base station's timing (i.e. TTI) relative to that of a reference base station is determined by the terminal and reported to the system. The system then instructs the new base station to adjust its transmit timing for the terminal such that the radio frames transmitted from this new base station are approximately **aligned in time to the radio frames from the other active base stations**));

Grilli does not expressly teach delaying the Transmission Time Intervals of the uplink and downlink for alignment in a communication system.

However, the preceding limitation is known in the art of communications. In the same field of endeavor, Suzuki teaches aligning TTI of instance radio channels in the uplink and downlink directions ([0066] (e.g. A preferred embodiment of the invention is therefore to have a **variable size TTI** for uplink and downlink directions, and a different number of ACK/NAK sub -TTI's are defined depending on the respective TTI sizes. The **TTI size** t.sub.TTI could be **configurable parameter** of the transmitter that needs to be signaled to the receiver. It would for be possible to **vary the TTI length** (I.e. Delaying by variable size TTI) for downlink transmission between three slots as described previously and one slot. If in downlink direction

one slot is used, for each TTI in downlink direction (i.e. for each time slot) an ACK/NAK sub - TTI of one time slot would be used in uplink direction, similar to the scheme depicted in FIG. 3. To obtain a flexible timing in such a case where the uplink sub -TTI is the same as the downlink TTI, different ACK/NAK signals need to be defined. It can happen that multiple ACK/NAK messages are received at the same time that needs to be distinguished. **There is the possibility that the downlink transmission is reconfigured from a TTI of one time slot to a TTI of three time slots while keeping the uplink sub -TTI of the ACK/NAK signal at one time slot** (i.e. delaying the TTI of an uplink channel with respect to a corresponding downlink channel by an amount dependent upon the measurement or estimate). In doing so, the possibility of a **flexible timing** (three time instances) of the feedback channel is obtained such as depicted in FIG. 6, while keeping exactly the same uplink slot structure. Such uniform uplink slot structure will reduce the implementation complexity));

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invitation to implement the methods of Suzuki within the method of Grilli in a wireless communication system. The new method improves wireless device interfacing and power scheme in addition to making it easier to manage in a low cost environment.

Regarding claim 12, Grilli in view of Suzuki teaches all the limitations of clam 11. Grilli further teaches a method wherein comprising means for measuring the response processing delay or a memory for storing a predefined response processing delay or delay amount ([0063] (e.g. For the W-CDMA system, the SFN-SFN type 1 **measurement** can be partitioned into the frame-level timing and the chip-level timing, as described above. Whenever requested to perform and report **time difference measurements** for a list of one or more base stations, the terminal

measures and reports the chip-level timing for each base station in the list. Additionally, the **terminal also measures and reports the frame-level timing** and includes this information in the SFN-SFN type 1 measurement only if required (e.g., as directed by the system) (i.e. user terminal measures its response processing delay))). [0087] In an embodiment, the base stations that are not in the terminal's active set but are in the **neighborhood of the terminal** (i.e., neighbor base stations) may be instructed by the system to **measure the uplink transmission from the terminal** (e.g., a transmission on the uplink dedicated physical channel (DPCH)). If the neighbor base stations are able to receive the **uplink transmission with sufficient strength**, then they can accurately **estimate the arrival time of the uplink transmission (I.e.** computes the amount of delay to be applied to uplink Transmission Time Intervals based upon that measurement, and signals that delay amount to the Radio Access Network). Based on the estimated signal arrival times from the neighbor base stations and a priori knowledge of the time relation between common channel frames among the various active and neighbor base stations, the **system can determine the proper timing for each neighbor base station that may be added to the terminal's active set such that the downlink transmission** from the added base station is properly **time-aligned at the terminal**)).

Regarding claim 13, Grilli teaches a Radio Network Controller for use in a Radio Access Network of a WCDMA system ([0008] (e.g. While in **soft handover** (I.e. bidirectional radio communication system), a terminal concurrently receives data transmissions (i.e., radio frames) from multiple base stations. To ensure that the radio frames arrive at the terminal within a particular time window so that they can be properly processed and recovered, the W-CDMA standard provides a mechanism whereby the starting time of the terminal-specific radio frames

from each base station to the terminal can be adjusted. Typically, before a new base station is added to the terminal's active set, this base station's timing (i.e. TTI) relative to that of a reference base station is determined by the terminal and reported to the system. The system then instructs the new base station to adjust its transmit timing for the terminal such that the radio frames transmitted from this new base station are approximately **aligned in time to the radio frames from the other active base stations**));

Grilli does not expressly teach delaying the Transmission Time Intervals of the uplink and downlink for alignment in a communication system.

However, the preceding limitation is known in the art of communications. In the same field of endeavor, Suzuki teaches the Controller comprising means for processing uplink physical channels taking into account delays, relative to the corresponding downlink physical channels, in the Transmission Time Intervals introduced by the sending user terminals based upon respective measures or estimates of the user terminal processing powers ([0066] (e.g. A preferred embodiment of the invention is therefore to have a **variable size TTI** for uplink and downlink directions, and a different number of ACK/NAK sub -TTI's are defined depending on the respective TTI sizes. The **TTI size** t.sub.TTI could be **configurable parameter** of the transmitter that needs to be signaled to the receiver. It would for be possible to **vary the TTI length** (I.e. Delaying by variable size TTI) for downlink transmission between three slots as described previously and one slot. If in downlink direction one slot is used, for each TTI in downlink direction (i.e. for each time slot) an ACK/NAK sub -TTI of one time slot would be used in uplink direction, similar to the scheme depicted in FIG. 3. To obtain a **flexible timing in such a case where the uplink sub -TTI is the same as the downlink TTI**, different ACK/NAK

signals need to be defined. It can happen that multiple ACK/NAK messages are received at the same time that needs to be distinguished. **There is the possibility that the downlink transmission is reconfigured from a TTI of one time slot to a TTI of three time slots while keeping the uplink sub -TTI of the ACK/NAK signal at one time slot** (i.e. delaying the TTI of an uplink channel with respect to a corresponding downlink channel by an amount dependent upon the measurement or estimates of the user terminal processing powers). In doing so, the possibility of a **flexible timing** (three time instances) of the feedback channel is obtained such as depicted in FIG. 6, while keeping exactly the same uplink slot structure. Such uniform uplink slot structure will reduce the implementation complexity));

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invitation to implement the methods of Suzuki within the method of Grilli in a wireless communication system. The new method improves wireless device interfacing and power scheme in addition to making it easier to manage in a low cost environment.

Regarding claim 14, Grilli teaches a method of controlling the broadcast power levels at a node of a bidirectional communication system ([0034] (e.g. FIG. 2A is a diagram illustrating a first system configuration (S1) in which a number of base stations (e.g., three in this example) are operated synchronously with time-aligned frame start and numbering. For this configuration, the radio frames on the common channels (i.e., common channel frames) for the base stations start at approximately the same time for each frame (i.e., at t.sub.n, t.sub.n+1, and so on). **The common channels are channels used to transmit information to all terminals**, and typically include the paging channel, **broadcast** channel, and so on. The synchronization between the base stations is denoted by the time relationship between the common channel frames for the base

stations being approximately constant in time, except possibly for small fluctuations around a nominal value.));

the method comprising sending power control signals to said node from a peer node at regular intervals on an uplink channel ([0066] (e.g. In one embodiment, the identities of the synchronous base stations are provided by the system to the terminal via user-specific messages. For the W-CDMA system, a **Measurement Control message** is sent to the **terminal each time a time difference measurement is to be performed and reported (i.e.** sending power control signals to a node from a peer node at regular intervals), (A set of "default" measurements is defined in the System Information message, sent on common channels, and is used by default unless a measurement control message is received.) The **Measurement Control message includes** a list of base stations for which time difference measurements are requested. This list may include the current active base stations and/or the neighbor base stations, which are potential candidate base stations for handover. For each base station in the list, the Measurement Control message may be configured to include an indication of whether or not frame-level timing is required for the base station)).

Grilli does not expressly teach delaying the Transmission Time Intervals of the uplink and downlink for alignment in a communication system.

However, the preceding limitation is known in the art of communications. In the same field of endeavor, Suzuki teaches the uplink and downlink channels being synchronized to ensure correct correlation between the power control signals and the respective broadcast power levels, the power control signals being delayed with respect to the downlink signal by an amount dependent upon the response processing delay at said peer node ([0066] (e.g. A preferred

embodiment of the invention is therefore to have a **variable size TTI** for uplink and downlink directions, and a different number of ACK/NAK sub -TTI's are defined depending on the respective TTI sizes. The **TTI size** t.sub.TTI could be **configurable parameter** of the transmitter that needs to be signaled to the receiver. It would for be possible to **vary the TTI length** (I.e. Delaying by variable size TTI) for downlink transmission between three slots as described previously and one slot. If in downlink direction one slot is used, for each TTI in downlink direction (i.e. for each time slot) an ACK/NAK sub -TTI of one time slot would be used in uplink direction, similar to the scheme depicted in FIG. 3. To obtain a **flexible timing in such a case where the uplink sub -TTI is the same as the downlink TTI**, different ACK/NAK signals need to be defined. It can happen that multiple ACK/NAK messages are received at the same time that needs to be distinguished. **There is the possibility that the downlink transmission is reconfigured from a TTI of one time slot to a TTI of three time slots while keeping the uplink sub -TTI of the ACK/NAK signal at one time slot** (i.e. delaying the TTI of an uplink channel with respect to a corresponding downlink channel by an amount dependent upon the measurement or estimates of the user terminal processing powers). In doing so, the possibility of a **flexible timing** (three time instances) of the feedback channel is obtained such as depicted in FIG. 6, while keeping exactly the same uplink slot structure. Such uniform uplink slot structure will reduce the implementation complexity));

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invitation to implement the methods of Suzuki within the method of Grilli in a wireless communication system. The new method improves wireless device interfacing and power scheme in addition to making it easier to manage in a low cost environment.

Regarding claim 15, Grilli in view of Suzuki teaches all the limitations of clam 14. Suzuki further teaches a method wherein the response processing delay is a time for said peer node, after receiving a message on a downlink channel from said node, to have a response ready to the received message to send over the uplink channel to said node ([0018] (e.g. As shown in FIG. 3, the base station transmits (Tx) a packet A to the mobile station UE1 on a physical channel. Due to the propagation **delay** t.sub.prop, the data is received (Rx) at the receiver UE1 a certain time after it has been transmitted. The receiver will now demodulate and decode the packet, and will generate an ACK or NAK acknowledgement message. For demodulating and decoding the packet and generating the acknowledgement message, there will be **a processing time** of t.sub.RXproc)).

Regarding claim 16, Grilli in view of Suzuki teaches all the limitations of clam 13. Grilli further teaches a controller wherein the respective measures or estimates of the user terminal processing power is based on a time required for the user terminal, after receiving a message over a downlink channel, to have a response to the received message ready to send over an uplink channel ([0074] (e.g. In response to the request (i.e. after receiving a message over a downlink channel), the terminal **estimates the chip-level time difference** for each base station in the list, at block 316. The chip-level time difference may be determined for each base station **relative to the timing of the reference base station (i.e.** estimates of the user terminal processing power is based on a time required for the user terminal to have a response to the received message ready to send over an uplink channel), which is a specific base station in the terminal's active set and is known to both the system and the terminal)).

Regarding claim 17, Grilli in view of Suzuki teaches all the limitations of clam 11. Grilli further teaches a terminal wherein the measurement or estimate of the response processing delay of the terminal is based on a time required for the user terminal, after reviewing a message over a downlink channel, to have a response to the message ready to send over an uplink channel ([0074] (e.g. In response to the request (i.e. after receiving a message over a downlink channel), the terminal **estimates the chip-level time difference** for each base station in the list, at block 316. The chip-level time difference may be determined for each base station **relative to the timing of the reference base station** (i.e. estimates of the user terminal processing delay is based on a time required for the user terminal to have a response to the received message ready to send over an uplink channel), which is a specific base station in the terminal's active set and is known to both the system and the terminal)).

Regarding claim 18, Grilli in view of Suzuki teaches all the limitations of clam 1. Grilli further teaches a terminal wherein the response processing delay is based on a time required for the user terminal, after reviewing a message over a downlink channel, to have a response to the message ready to send over an uplink channel ([0074] (e.g. In response to the request (i.e. after receiving a message over a downlink channel), the terminal **estimates the chip-level time difference** for each base station in the list, at block 316. The chip-level time difference may be determined for each base station **relative to the timing of the reference base station (i.e.** processing delay is based on a time required for the user terminal to have a response to the received message ready to send over an uplink channel), which is a specific base station in the terminal's active set and is known to both the system and the terminal)).

Conclusion

1. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mahendra Patel whose telephone number is 571-270-7499. The examiner can normally be reached on 9:30 AM to 5:30 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, V. Paul Harper can be reached on 571-272-7605. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http: //pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/MAHENDRA R PATEL/
Examiner, Art Unit 2617

/VINCENT P. HARPER/
Supervisory Patent Examiner, Art Unit 2617